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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

REPORT OF PINE BEETLE SURVEYS on the GLENWOOD DISTRICT of the KLICKITAT RIVER INFESTATION AREA YAKIMA AND KLICKITAT COUNTIES, WASHINGTON 1935 - 1938

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REPORT OF PINE BEETLE SURVEYS
on the
GLENWOOD DISTRICT
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YAKIMA AND KLICKITAT COUNTIES, WASHINGTON
1935-1938

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Introduction.

The so-called "Klickitat River Infestation Area" includes extensive ponderosa pine stands inside and outside the Yakima Indian Reservation in Klickitat, Yakima, and Columbia Counties, Wash. From an entomological standpoint, this area comprises those stands in the drainage of Klickitat River and its tributaries within the reservation, as well as those stands outside the reservation which are west of Grayback Mountain and Klickitat River. However, from an administrative and reporting standpoint, those private, state, and federally-owned stands from the southwestern boundary of the Yakima Indian Reservation to the breaks of the Columbia River, and west of Klickitat River to the upper slope types of the Cascade Mountains, constitute the "Glenwood District" which is the area covered by this report.

In September 1935 two permanent 320-acre check plots were established in the Glenwood Unit of this district for the purpose of following infestation trends of the western pine beetle (Dendroctonus brevicomis Lec.) in these valuable commercial stands. A history of recent pine beetle activity in this district, particularly the Glenwood Unit, an account of the establishment of the check plots, and the results of the 1935 survey will be found in a report by Mr. F. P. Keen of the Portland forest insect laboratory.1/

Since no report has been made of subsequent pine beetle surveys on this district, a summary covering the period 1935 to 1938 is herewith presented.

History of the Surveys.

An annual survey has been made on the two check plots since their establishment in 1935, as part of the regional bark beetle survey conducted cooperatively by the U. S. Forest Service and the Bureau of Entomology and Plant Quarantine. The personnel of the survey crews have been employed through the office of the Regional Forester and have been technically directed by the Portland forest insect laboratory. The former local fire warden stationed at Glenwood, Mr. Conboy, and the present warden, Mr. M. A. Jemtegaard, have been interested in these surveys and have assisted the various crews in locating the check plots.

1/ F. P. Keen Report of pine beetle survey of the Glenwood Infestation Area, Klickitat County, Washington. September 9-14, 1935.

The 1936 survey was made during the period September 15-16 by a three-man crew composed of Messrs. F. C. Brame, J. Wood, and C. L. Gordon. In 1937 the plots were recruised during the period July 19-20 by a five-man crew consisting of Messrs. R. C. Grant (Crew Leader), J. B. Gabriel, R. E. Geoghegan, C. M. Fiels, and E. A. Brackett, who were directly supervised by W. J. Buckhorn of the Portland laboratory. The 1938 survey was made by a three-man crew composed of Messrs. R. M. Ramstad (Crew Leader), S. O. Norman, and M. Wyman, during the period September 19-20. They were directly supervised by the writer.

Beside the intensive check plot cruises, the general western pine beetle situation in the Glenwood District has been checked in two ways. The 1936 survey crew ran 18.25 miles of tally-wide strips through portions of the district to determine the relation of the check plot data to the surrounding stands. During the period September 28-29, 1938, the writer made an extensive or observational survey over the district as a whole. The ponderosa pine stands in the following drainages were examined: White Salmon River; Outlet, Bacon, Bird, Goetchen, and Cave Creeks; and that portion of the Klickitat River within the area boundary. The results of these additional surveys will be discussed below.

Infestation Data, 1935-1937, inclusive.

As pointed out in Mr. Keen's report[1/], the western pine beetle, aided by the severe windstorm of 1931 and a preceding drought period, caused losses of epidemic proportion during 1932 and 1933. In 1934 the infestation lessened, and in 1935 the losses reached their lowest point since these detailed observations have been made. Since 1934 these losses have represented a decidedly endemic condition. A slight increase was noted in 1936, but this proved to be temporary, for the losses declined again in 1937.

A tabulation of the losses on the two check plots from 1935 to 1937, inclusive, will be found in Table No. 1.

Infestation Data, 1938.

The current surveys were made during the period September 19-20, at which time approximately 66 percent of the probable losses were spotted and recorded. The estimated losses for 1938, based on these partially completed surveys, show a marked increase over

the 1937 losses. While the exact status of the present infestation will not be available until after the 1939 cruise, it appears that most of this increase occurred during the summer generations, with a decided decline noted in the winter generation. However, it is felt that these losses still represent an endemic or normal condition.

In Table No. 2 a comparison is made between the number of trees killed on the check plots in 1937 and the number estimated for 1938.

Table No. 2

Number of Trees Spotted on Check Plots
Glenwood District, Washington

Unit and Plot	1937 Loss: Spotted at Time of First Cruise	1937 Loss: Total Spotted	1938 Loss: Spotted at Time of First Cruise	1938 Loss: Total Estimated	Remarks
GLENWOOD					
Bacon Creek	4	15	32	48	Increase 220%
Red Butte	7	16	24	36	Increase 125%
Total	11	31	56	84	Increase 170%

During the observational survey made by the writer over the Glenwood District as a whole, an estimate was made of the total 1937 loss. This was made on a per-section basis, using the check plot data as a guide. These estimates were part of the 1938 regional bark beetle survey program and covered the entire commercial ponderosa pine types of Oregon and Washington. They were made by the entomologist supervising each survey crew. The results of these estimates for the Glenwood District are shown on the infestation map at the end of this report. This map shows the status of the western pine beetle in 1937, as well as the character of the pine stands in this district. It will be noted from this map that the heaviest concentration of beetles--that portion shown in green--was found in the stands in Yakima County west of Klickitat River, and in the stands east of Red and Quigley Buttes.

Estimated Losses for the Glenwood District as a Whole, 1931-1938.

The first estimate of losses caused by the western pine beetle in this infestation district as a whole was made by Mr. Keen in 1934.[2] In 1936[1] general estimates were made for the Glenwood unit.

The present estimates are based on check plot surveys, strip cruises, and observational surveys made during these regional bark beetle surveys, as well as on data from a number of growth plots of the Pacific Northwest Forest and Range Experiment Station which are scattered over this district. For the purpose of these estimates, timber ownership classes have been disregarded and the losses computed for the district as a whole. A statement of these losses since 1931, together with the tentative 1938 losses, is given in Table No. 3.

It will be noted in this table that the losses for the period 1931 to 1934 are higher than those previously made. The former estimates were raised because all available data on pine mortality during this period showed that, for the area as a whole, the losses caused by the western pine beetle had been heavier than previously assumed.

Summary and Recommendations.

The Glenwood District comprises those ponderosa pine stands west of Klickitat River and Grayback Mountain from the Yakima Indian Reservation to the breaks of the Columbia River. Included in the 149,000 acres of merchantable pine in this area are private, state, and federally-owned lands, with the majority of the timber owned by the J. Neils Lumber Company of Klickitat, Wash.

Two permanent 320-acre check plots were established and cruised in the Glenwood unit of this district in September 1935. Annual cruises have been made through the cooperative effort of the U. S. Forest Service and the Bureau or Entomology and Plant Quarantine.

Western pine beetle losses were very heavy during the period 1931 to 1934 inclusive. Since 1934 these losses have been decidedly endemic in nature.

2/ Keen, F. P. Annual report of the forest insect conditions in Oregon and Washington for 1933. May 1, 1934.

No control measures have been undertaken in this district, even during the epidemic years of 1932 and 1933. None are necessary at the present time.

The check plots should be recruised in 1939 and another observational survey should be made over the district as a whole. Portions of the Glenwood Unit, particularly the Bird Creek and Bacon Creek drainages, should be rather carefully examined during 1939. It was in these stands that the heaviest 1937 and 1938 losses were observed.

Table No. 1

Annual Ponderosa Pine Mortality on Check Plots
Glenwood District, Washington

Unit and Plot Location	Pine Timbered Acres and 1935 Stand Volume	Site Quality	Losses: Year of Attack	Trees Killed	Bd.ft. Volume Killed	Bd.ft. Killed per A.	Gross % Stand Killed
GLENWOOD			1935	10	5,310	16	.15
			1936	20	12,800	40	.36
Bacon Creek	320		1937	15	8,910	28	.25
T. 7N, R. 12E, Sec. 27N½	3,520 M.b.m.	IV	Total	45	27,020	84	.76
			Mean	15	9,000	28	.25
Red Butte			1935	11	3,200	10	.11
T. 16N, R. 11E,	320		1936	16	10,130	32	.33
Sec. 13E½	3,045 M.b.m.	IV	1937	16	9,650	30	.32
			Total	43	22,980	72	.76
			Mean	14	7,660	24	.25
TOTAL	640		1935	21	8,510	13	.13
			1936	36	22,930	36	.35
	6,565 M.b.m.	IV	1937	31	18,560	29	.28
			Total	88	50,000	78	.76
			Mean	29	16,600	26	.25

Table No. 3

Estimated Ponderosa Pine Mortality on the Glenwood District
1931 - 1938

GLENWOOD DISTRICT

Acres of merchantable ponderosa pine - 149,000.
Total ponderosa pine volume - 1,060,000 M.b.m.

Year of Attack	No. of Trees Killed	Volume Killed M.b.m.	Gross Percent of Stand Killed
1931	10,000	7,400	.7
1932	53,000	31,800	3.0
1933	33,000	20,000	2.0
1934	28,000	18,500	1.8
1935	8,000	2,800	.3
1936	6,500	3,600	.4
1937	5,500	2,600	.3
Total	144,000	86,700	8.5
Mean	20,600	12,400	1.2
(Tent.) 1938	4,500	4,200	.4

1938 PINE BEETLE SURVEY OF PONDEROSA PINE IN OREGON AND WASHINGTON

GLENWOOD DISTRICT OF THE KLICKITAT RIVER INFESTATION AREA WASHINGTON

LEGEND

AREA BOUNDARIES ——

UNIT BOUNDARIES

1937 BEETLE LOSS

0-25 trees per section. Normal infestation. Roughly about 0 to 1/4 of one percent of stand volume.

25-50 trees per section. Normal infestation. 1/4 to 1/2 of one percent of stand volume.

50-100 trees per section. Light epidemic infestation. 1/2 to 1 percent of stand volume.

100-200 trees per section. Moderate epidemic infestation. 1 to 2 percent of stand volume.

200-400 trees per section. Heavy epidemic infestation. 2 to 4 percent of stand volume.

Over 400 trees per section. Very heavy epidemic infestation. Over 4 percent of stand volume.

PONDEROSA PINE TYPES

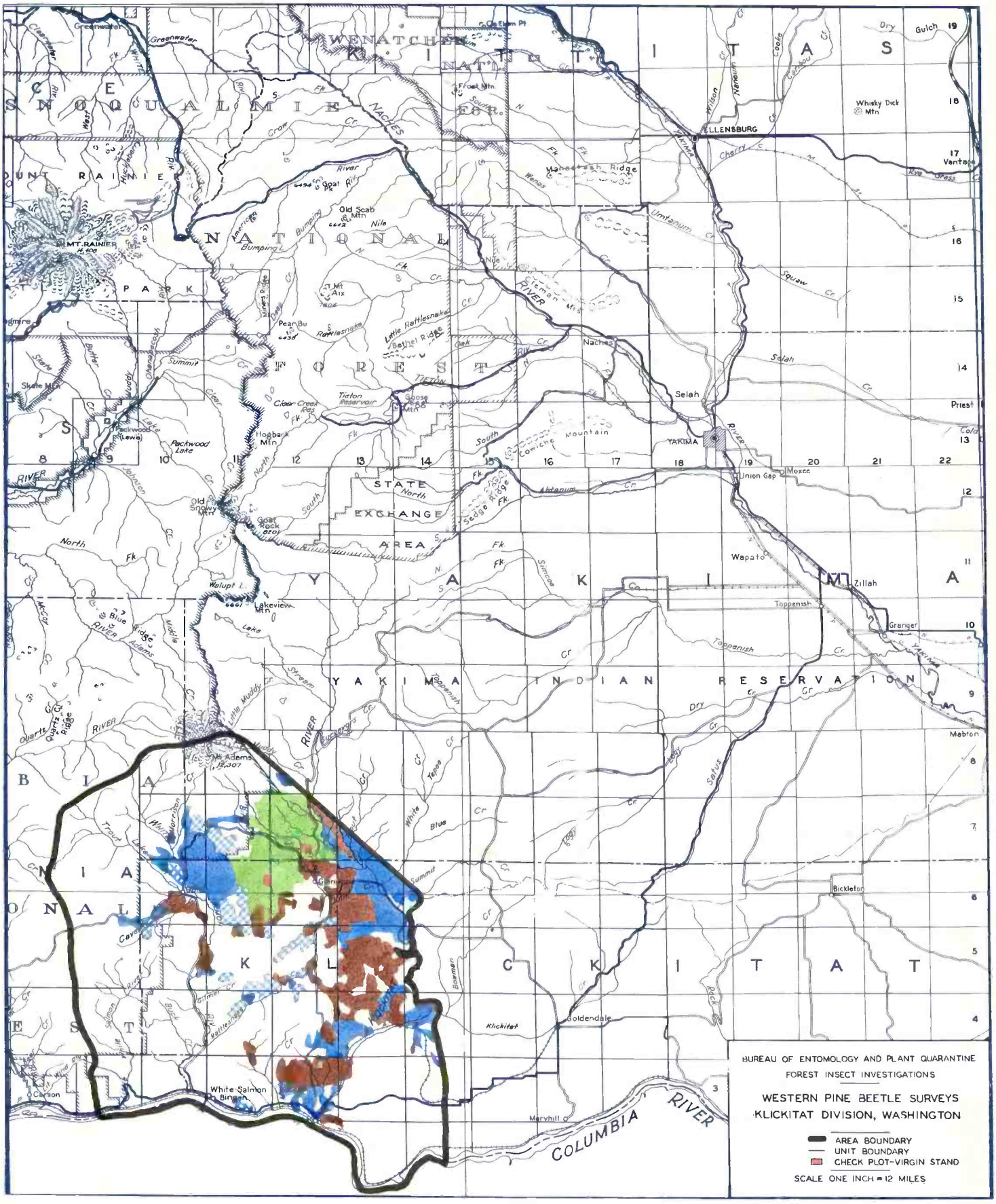
Solid colors. Stands containing more than 50% ponderosa pine and of average or better thrift and vigor. In these stands the western pine beetle is the chief tree-killing agent.

Cross-hatched colors. Stands containing from 20-50% ponderosa pine.

Dotted colors. Ponderosa pine stands of marginal or fringe type. In many of these areas drought as well as insects is an important tree-killing factor.

Cut-over areas.

U. S. BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
U. S. FOREST SERVICE
Portland, Oregon


WENATCHEE NATIONAL FOREST
SNOQUALMIE NATIONAL FOREST
MT. RAINIER NATIONAL PARK
GIFFORD PINCHOT NATIONAL FOREST
YAKIMA INDIAN RESERVATION
STATE EXCHANGE AREA
ELLENSBURG
YAKIMA
Selah
Naches
Union Gap
Moxee
Wapato
Zillah
Toppenish
Granger
Mabton
Bickleton
Goldendale
White Salmon
Carson
Mt. Adams
Lakeview Mtn.
Old Snowy Mtn.
Hogback Mtn.
Goose Egg Mtn.
Cowiche Mountain
Whisky Dick Mtn.
Frost Mtn.
Old Scab Mtn.
Mt. Aix
Pear Bu
Skate Mtn.
Tieton Reservoir
Packwood Lake
Walupt L.
Clear Creek Res.
Goat Rock
Maryhill
COLUMBIA RIVER
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEYS
KLICKITAT DIVISION, WASHINGTON
AREA BOUNDARY
UNIT BOUNDARY
CHECK PLOT-VIRGIN STAND
SCALE ONE INCH = 12 MILES